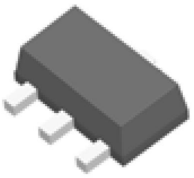
78SXXM
Three-terminal Voltage Regulator

General Description



SOT89-3

The 78SXXM series of three terminal positive regulators employ internal current limiting and thermal shutdown, making them essentially indestructible. If adequate heat-sink is provided, they can deliver up to 200 mA output current.

They are intended as fixed voltage regulators in a wide range of applications including local or on- card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power pass elements to make high-current voltage regulators. The 78SXXM series used as Zener diode/resistor combination replacement, offers improvement along with lower quiescent current and lower noise.

Features

- Maximum Output Current: 200mA
- Output Voltage of 5V ,6V,8V,9V,12V,15V Available
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- Continuous Total Dissipation 0.5W
- 78SXXM is available in SOT89-3 package

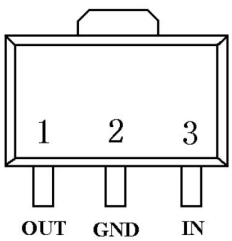
Package Information

Part NO.	Package Description	Package Marking	Package Option
78SXXM	SOT89-3	78SXXM SXXXX	1000/Reel

SXXXX:Lot NO. 78SXXM:Part NO. (XX:Output Voltage)

XX(Output Voltage): 05(5.0V)/06(6.0V)/08(8.0V)/09(9.0V)/12(12V)/15(15V)

Pin Configuration

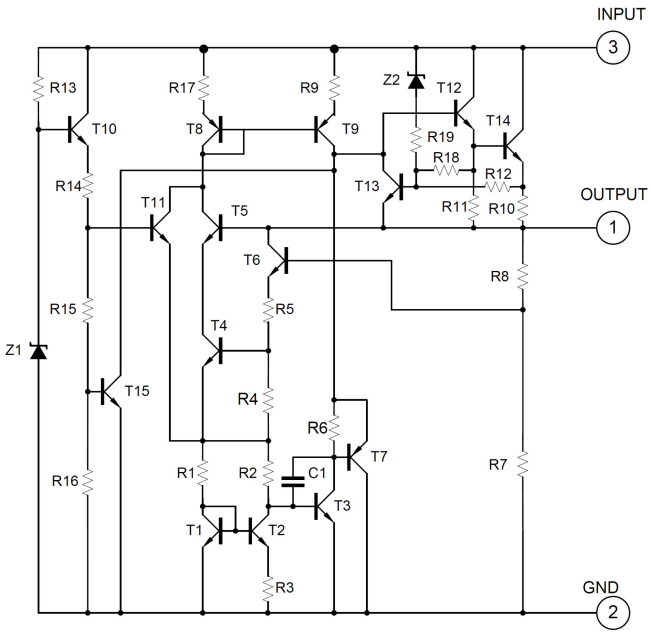


78SXXM(SOT89-3)

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Value	Units
Input Voltage	Vi	35	V
Operating Temperature Range	Topr	-40~ +125	°C
Storage Temperature Range	Tstg	-55 ~ +150	°C

Block Diagram



Electrical Characteristics

For 78S05M(unless otherwise noted, Vi=10V,Io=40mA,Ci=0.33μF,Co=0.1μF)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	Tj=25°C	4.8	5.0	5.2	V
		7V≤Vi≤20V Io=5mA~150mA	4.75	5.0	5.25	
Load Regulation	Δ Vo	Tj=25°C,Io=1mA~200mA		30	100	mV
		Tj=25°C,Io=1mA~40mA		10	50	
Line Regulation	Δ Vo	7V≤Vi≤20V, Tj=25°C		11	60	mV
		8V≤Vi≤20V, Tj=25°C		5	30	
Quiescent Current	Iq	Tj=25°C		3.8	6	mA
Quiescent Current Charge	Δ Iq	7V≤Vi≤20V,Io=40mA			1.5	mA
		5mA≤Vi≤150mA			0.1	
Output noise Voltage	V_N	10Hz≤f≤100kHz		42	200	μV
Dropout Voltage	Vd	Tj=25°C		1.7		V
Ripple Rejection	RR	7V≤Vi≤20V,f=120Hz, Tj=25°C	41	49		dB

For 78S06M(unless otherwise noted, Vi=11V,Io=40mA, Ci=0.33μF,Co=0.1μF)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	Tj=25°C	5.79	6.0	6.21	V
		8V≤Vi≤21V Io=5mA~150mA	5.70	6.0	6.30	
Load Regulation	Δ Vo	Tj=25°C,Io=1mA~200mA		30	100	mV
		Tj=25°C,Io=1mA~40mA		10	50	
Line Regulation	Δ Vo	8V≤Vi≤21V, Tj=25°C		11	60	mV
		9V≤Vi≤20V, Tj=25°C		5	30	
Quiescent Current	Iq	Tj=25°C		3.8	6	mA
Quiescent Current Charge	Δ Iq	8V≤Vi≤21V,Io=40mA			1.5	mA
		5mA≤Vi≤150mA			0.1	
Output noise Voltage	V_N	10Hz≤f≤100kHz		42	200	μV
Dropout Voltage	Vd	Tj=25°C		1.7		V
Ripple Rejection	RR	8V≤Vi≤21V,f=120Hz, Tj=25°C	41	48		dB

For 78S08M(unless otherwise noted, Vi=14V,Io=40mA,Ci=0.33μF,Co=0.1μF)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	Tj=25°C	7.72	8.0	8.28	V
		10.5V≤Vi≤23V Io=5mA~150mA	7.60	8.0	8.40	
Load Regulation	Δ Vo	Tj=25°C,Io=1mA~200mA		26	160	mV
		Tj=25°C,Io=1mA~40mA		10	80	
Line Regulation	Δ Vo	10.5V≤Vi≤23V, Tj=25°C		11	100	mV
		11V≤Vi≤25V, Tj=25°C		5	50	
Quiescent Current	Iq	Tj=25°C		3.8	6	mA
Quiescent Current Charge	Δ Iq	10.5V≤Vi≤23V,Io=40mA			1.5	mA
		5mA≤Vi≤150mA			0.1	
Output noise Voltage	V_N	10Hz≤f≤100kHz		42	200	μV
Dropout Voltage	Vd	Tj=25°C		1.7		V
Ripple Rejection	RR	10.5V≤Vi≤23V,f=120Hz, Tj=25°C	39	46		dB

For 78S09M(unless otherwise noted, Vi=15V,Io=40mA,Ci=0.33μF,Co=0.1μF)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	Tj=25°C	8.68	9.0	9.32	V
		11.5V≤Vi≤26V Io=5mA~150mA	8.55	9.0	9.45	
Load Regulation	Δ Vo	Tj=25°C,Io=1mA~200mA		26	160	mV
		Tj=25°C,Io=1mA~40mA		10	80	
Line Regulation	Δ Vo	11.5V≤Vi≤26V, Tj=25°C		11	100	mV
		13V≤Vi≤26V, Tj=25°C		5	50	
Quiescent Current	Iq	Tj=25°C		3.8	6	mA
Quiescent Current Charge	Δ Iq	7V≤Vi≤20V,Io=40mA			1.5	mA
		5mA≤Vi≤150mA			0.1	
Output noise Voltage	V_N	10Hz≤f≤100kHz		42	200	μV
Dropout Voltage	Vd	Tj=25°C		1.7		V
Ripple Rejection	RR	11.5V≤Vi≤26V,f=120Hz, Tj=25°C	39	46		dB

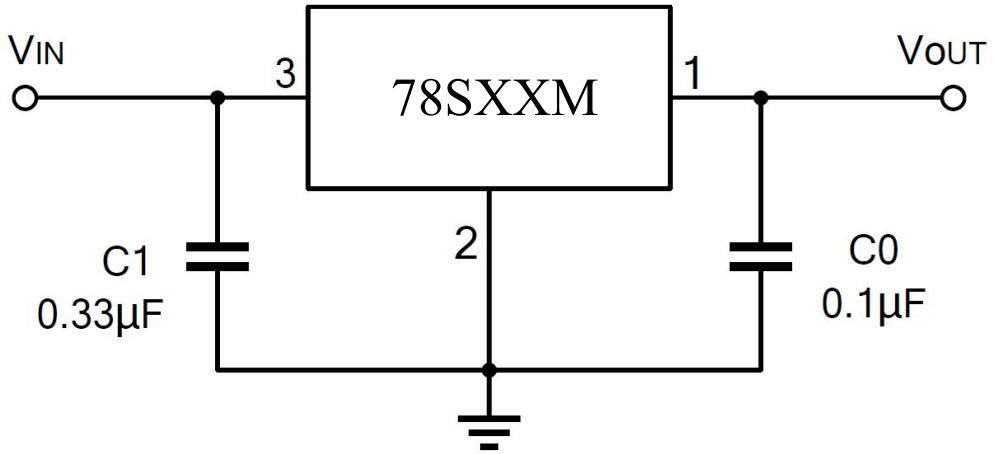
For 78S12M(unless otherwise noted, Vi=19V,Io=40mA,Ci=0.33μF,Co=0.1μF)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	Tj=25°C	11.6	12.0	12.4	V
		14.5V≤Vi≤30V Io=5mA~150mA	11.4	12.0	12.6	
Load Regulation	Δ Vo	Tj=25°C,Io=1mA~200mA		26	160	mV
		Tj=25°C,Io=1mA~40mA		10	120	
Line Regulation	Δ Vo	14.5V≤Vi≤30V, Tj=25°C		14	250	mV
		16V≤Vi≤30V, Tj=25°C		10	100	
Quiescent Current	Iq	Tj=25°C		3.8	6	mA
Quiescent Current Charge	Δ Iq	14.5V≤Vi≤30V,Io=40mA			1.5	mA
		5mA≤Vi≤150mA			0.1	
Output noise Voltage	V_N	10Hz≤f≤100kHz		42	200	μV
Dropout Voltage	Vd	Tj=25°C		1.7		V
Ripple Rejection	RR	14.5V≤Vi≤30V,f=120Hz, Tj=25°C	39	46		dB

For 78S15M(unless otherwise noted, Vi=23V,Io=40mA, C1=0.33μF,Co=0.1μF)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	Tj=25°C	14.5	15.0	15.5	V
		17.5V≤Vi≤30V Io=5mA~150mA	14.3	15.0	15.7	
Load Regulation	Δ Vo	Tj=25°C,Io=1mA~200mA		26	160	mV
		Tj=25°C,Io=1mA~40mA		10	150	
Line Regulation	Δ Vo	17.5V≤Vi≤30V, Tj=25°C		11	100	mV
		20V≤Vi≤30V, Tj=25°C		2	50	
Quiescent Current	Iq	Tj=25°C		3.8	6	mA
Quiescent Current Charge	Δ Iq	14.5V≤Vi≤30V,Io=40mA			1.5	mA
		5mA≤Vi≤150mA			0.1	
Output noise Voltage	V_N	10Hz≤f≤100kHz		42	200	μV
Dropout Voltage	Vd	Tj=25°C		1.7		V
Ripple Rejection	RR	17.5V≤Vi≤30V,f=120Hz, Tj=25°C	39	46		dB

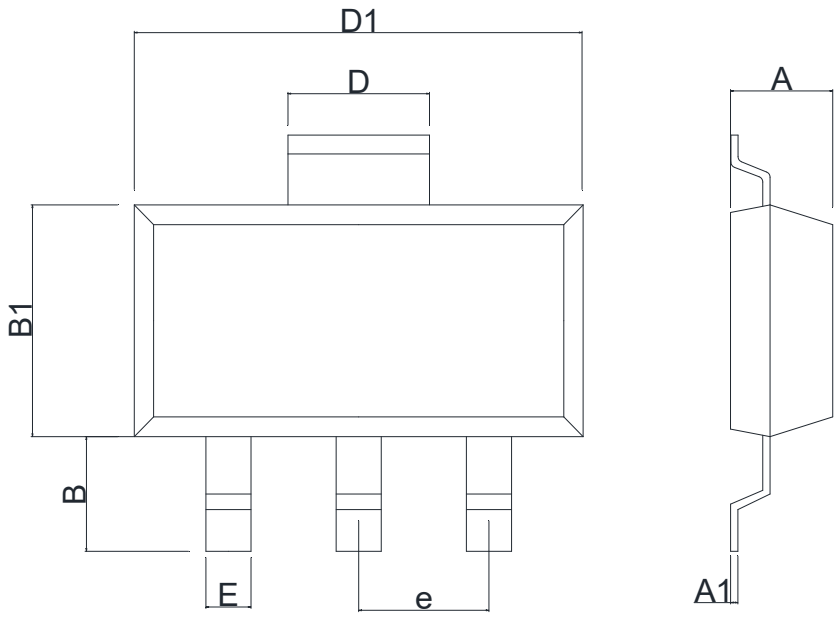
Application Circuit



*Bypass capacitors are recommended for optimum stability and transient response and should be located as close as Possible to the regulators.

Outline Dimensions

SOT89-3 Unit: mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.450	1.550	0.057	0.061
A1	0.390	0.410	0.015	0.016
B	0.950	1.050	0.037	0.041
B1	2.350	2.550	0.092	0.100
E	0.350	0.450	0.013	0.017
D1	4.400	4.600	0.173	0.181
D	1.550 REF		0.061 REF	
e	1.500（BSC）		0.059（BSC）	

Statements

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- The product upgrades without end, Silicore Technology will wholeheartedly provide customers integrated circuits that have better performance and better quality.